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A RESEARCH-ORIENTED ELEMENTARY EDUCATION STUDENT TEACHING PROGRAM.

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THIS STUDY INVOLVED FOUR PREMISES ABOUT TEACHING--(1) THE DEVELOPMENT OF SYSTEMATIC, RATIONAL THINKING WILL IMPROVE THE QUALITY OF TEACHING, (2) RESEARCH TRAINING WILL HELP DEVELOP RATIONAL SYSTEMATIC THINKING, (3) GENERAL TEACHER EDUCATION OUTCOMES REFLECT THE QUALITY OF THINKING, AND (4) THE STUDENT TEACHING EXPERIENCE IS THE MOST CRITICAL ELEMENT. THE MAJOR HYPOTHESIS OF THE STUDY DEALT WITH THE OBSERVABLE EFFECTS OF A RESEARCH-ORIENTED, STUDENT TEACHING EXPERIENCE ON THE IMPROVEMENT OF DECISION-MAKING IN TEACHING. THREE GROUPS OF ELEMENTARY STUDENT TEACHERS WERE SELECTED--(1) THE EXPERIMENTAL, WHICH RECEIVED A MODIFIED PROGRAM AND RESEARCH EXPERIENCES IN STUDENT TEACHING, (2) THE EXPERIMENTAL-CONTROL, WHICH RECEIVED A MODIFIED PROGRAM ONLY, AND (3) THE CONTROL, WHICH EXPERIENCED NO MODIFICATIONS IN PROGRAM. ONE OUTCOME OF THE STUDY WAS THAT EARLY PREDICTIONS OF SUCCESS MADE BY INSTRUCTORS REMAINED CORRELATED WITH PERFORMANCE BOTH AT THE END OF STUDENT TEACHING AND THE FIRST YEAR OF TEACHING. ONE POSSIBLE EXPLANATION WAS THAT THERE IS A GLOBAL QUALITY ABOUT INDIVIDUALS, TIED TO PERSONALITY AND ABILITY AND EVIDENCED IN INTERPERSONAL RELATIONS, WHICH REMAINS CONSISTENT REGARDLESS OF TRAINING METHOD OR TRADITIONAL STUDENT TEACHING EXPERIENCE. ONE CONCLUSION WAS THAT THE SIGNIFICANCE OF THE STUDENT TEACHING EXPERIENCE SHOULD BE QUESTIONED. (AW)

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A RESEARCH ORIENTED ELEMENTARY EDUCATION STUDENT TEACHING PROGRAM

Cooperative Research Project No. 1091

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FOREWORD

The project here reported grew out of the professional concerns of a number of faculty members and administrators in the School of Education at the University of Wisconsin-Milwaukee. A central motivation for the study was the interest of many in the importance of a research or experimental approach to teaching. The rapidity of change and the growth of knowledge both suggested a conception of teaching and teacher preparation that focused more upon inquiry and analysis than upon the provision of established answers. The teacher was seen as being more appropriately an agent in helping students to find out rather than the source of information.

This concept of teaching caused the University of Wisconsin-Milwaukee group to ask what might be done in the preparation of prospective teachers to foster more experimental and analytic attitudes toward teaching. Rather than postponing the concern for research to graduate study, as is true of most programs, it was felt that such an emphasis should be considered for introduction in the undergraduate program.

Relating to this same point of view was the growing conviction that the University laboratory school should itself be focused upon an innovative and experimental approach and its staff capable of demonstrating the relevance of research to classroom teaching. It seemed increasingly apparent to many of us that university laboratory schools could not justify their existence in terms of providing convenient student teaching stations and demonstration centers.

The project undertaken represents a logical intersection of our interest in research as applied to the role of the classroom teacher and research and experimentation seen as a major function of a university laboratory school.

Both the original project proposal and the subsequent operation of the study are the results of cooperative effort on the part of many School of Education members. Without such close cooperation such a study would obviously have been impossible.

The intent of the project was to provide new knowledge about teacher education programs, both for the purpose of program development at the University of Wisconsin-Milwaukee and for possible implications to the field of teacher preparation in general. We are hopeful that the report of the project may be helpful in both respects.

George W. Denemark
Dean, School of Education
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ACKNOWLEDGEMENTS

The study reported here was a cooperative effort involving many staff members of the School of Education at the University of Wisconsin-Milwaukee.

In effect this study entailed considerable accommodation on the part of members of the Department of Elementary Education over two consecutive years. Those persons who have attempted to do teacher education program research of the scope of this study can readily appreciate the remarkable spirit necessary among these staff members in order to accomplish this task.

Innovation, however, is not new to this institution. For many years, when formerly a part of the Milwaukee State Teachers College, the elementary education program was widely acclaimed as a model for new visions in program development. Thus, this research study found fertile ground for its development.

It should further be noted that the present climate for research and development, which exists in the School of Education, has been stimulated to a considerable extent by the vigorous and able leadership of its Dean, George Denemark; his initiation of this study gave the needed impetus for the plans which eventuated in the result reported here.

Special thanks are due to Professor Gerald Gleason, Chairman of the Department of Elementary Education, for guidance and consultation on the project; to Professor Bernice Wolfson and John Stillman for staffing the modified groups; to Mrs. Esther Zaret for

time commitments far beyond the usual research associate; and, to the many staff members of the Campus Elementary School and cooperating public schools that participated.

James B. Macdonald
Principal Investigator

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CHAPTER I

THE PROBLEM AND RELATED RESEARCH

Introduction

Research on problems in teacher education has been sparse. During recent years, new programs have been developed at increasingly rapid rates, but few of these new programs have been subjected to careful control and analysis in a formal research setting.

The "Directory of Innovations in Teacher Education" prepared for use in the Columbus, Ohio Teacher Education Professional Standards (TEPS) Conference of June 25-28, 1963, is indicative of the state of innovation in teacher education. Here there are listed short summaries of well over two hundred attempts to provide for new programs and procedures in teacher education. Although detail is lacking, most summaries do not suggest the existence of careful research procedures as integral parts of the studies.

The need for research in teacher education was a major motivating condition for the development of the study to be reported here.

The Problem

Two assumptions of value combine to provide the central focus for this study. The first is the assumption that a systematic, logical, reflective approach to decision-making is extremely

important to effective teaching. The second is the assumption that the student teaching experience represents a critical ingredient in the pre-service preparation of teachers. This project was an attempt to examine the extent to which effective decision-making, reflected in certain criterion measures, can be fostered in teachers through a special student teaching experience that emphasizes an experimental, research oriented approach to the problems of teaching.

Herrick and Tyler[1], and Tyler[2] have stressed the importance of decision-making in teaching. Decision-making is defined essentially as a rational process of selecting from among alternatives, resolving value conflicts and constructing programs and procedures in some rational, orderly, and systematic fashion. It was the development of this orderly, logical, systematic decision-making that this experiment examined in the context of student teaching experience.

One vehicle for the development of these procedures is seen as the research process. As Fred Barnes notes: "Teaching is researching, and the research process presents a systematic approach to understanding which can be equated broadly with Dewey's logical thought patterns."[3]

The importance of systematic, orderly procedure has most recently been recognized as one of the outcomes of a study reported by Louis M. Heil.[4] The study is now being replicated but initial results indicate that teachers classified as methodical and systematic have classrooms in which pupil outcomes are consistently greater.

The role of the laboratory phase of teacher preparation designed to foster such an approach to teaching appears to be

extremely important. Yet, as Michaelis says, "Little research has been done on the evaluation of student teaching programs; in fact, very little evaluation of student teaching has been done. Most institutions have tended to accept student teaching on the basis of its rating as the most valuable part of the teacher education program."[5]

The assumption was made in this study that student teaching experience is essential to pre-service teacher education. Variations in the nature of the student teaching experience were introduced to study their effects upon certain aspects of the beginning teacher's thinking, personal characteristics, and classroom performance.

Accepting the importance of student teaching, the desirability of rational analysis, and the necessity for an orderly, systematic approach to teaching, the major focus of study in this project was a program for student teachers which had been deliberately designed to develop rational, systematic thinking about teaching. For the purposes of this study, this type of thinking has been equated with the research process.

The significance of the research approach to teacher education lies in the recognition of the complexity of the teaching act. It is impossible and actually undesirable to rest the case for learning in teacher education upon memory, imitation, and identification alone. It is only through stimulating self-generating mechanisms that continual growth can take place. The research process as a vehicle for the development of rational thinking seems to offer one avenue for development of a self-generating mechanism. If this can be demonstrated, then the implications for teacher education are manifold. The whole concept of programing would need to be re-examined in an attempt to identify other self-generating

mechanisms, and to organize experiences designed to promote the development of these mechanisms.

Thus to summarize briefly, four steps in a logical set are proposed: (1) That systematic, rational thinking affects the quality of teaching; (2) That research training represents one valid way to develop systematic thinkers and decision makers; (3) That general teacher education outcomes of a cognitive, affective, and performance nature reflect the quality of thinking and/or decision-making in teaching; and, (4) That student teaching is the single most crucial experience in the teacher preparation program.

Related Research

Research concerning the research process as a vehicle for developing teacher competency is at a minimum. Fleming,[6] and Taba[7] have reported in-service programs in New Jersey and California that appear relevant. However, in neither case are the evaluations of teacher growth adequately documented, though both reports support the desirability of action research as a learning procedure.

Articles by Frymier,[8] Parrodin,[9] and Hansen[10] incorporate the action research approach in teacher education programs. Results of these studies are generally supportive of the proposal, though none were as well controlled or focused specifically upon decision-making.

More general references suggesting and illustrating the research approach to learning are Research for Curriculum Improvement, the 1957 Yearbook of the Association for Supervision and Curriculum Development (ASCD); Action Research to Improve School

Practices, Stephen Corey; Understanding Group Behavior of Boys and Girls, Ruth Cunningham; and, The Action Research Way of Learning, Abraham Shumsky.

Turner and Fattu[11] have been concerned with the problems of teacher effectiveness, and especially with the criterion of problem solving as an assessment of skill in teaching.

Fattu and Turner[12] stated that about one-third of a teacher's role activities were specifically related to professional knowledge. This portion, they felt, was the area which distinguished good from poor teachers. They called the area "problem solving." In interpreting results of their study they said:

> Second, the opportunities a teacher has had to learn to teach both during preparation and during teaching experience are among the central determinants of his proficiency in solving teaching problems. The results suggest that educators might seriously consider placing less emphasis upon personal characteristics, as the determiners of teaching skill and place more emphasis on the development of intellectual skills relevant to the resolution of teaching problems.[13]

Greif[14] investigated the effect of a distinct emphasis on creative and critical thinking in teachers education. He found significant gains in student teachers' ability to think and in their general teaching ability after they had experienced methods courses in arithmetic and language arts that had heavily emphasized creative and critical thinking.

Bradtmueller[15] investigated, among other things, the development of skill in problem solving related to the teaching of reading during student teaching. He found that student teachers made significant gains during the period investigated.

Waimon[16] is presently investigating whether prospective teachers who systematically study teaching behaviors, will show

greater growth in their readiness to solve teaching problems. His study is similar to the one reported here. In each study the experiencing of a systematic analysis of teaching or of teaching problems is utilized to promote better teaching. The essential difference lies in the method of systematic study, analysis of teaching in Waimon's study, and action research in the case of the present study.

In general, it may be said that the attempt to improve teaching by fostering the powers of cognitive decision-making in teachers, through more systematic training or experience during pre-service programs has been and continues to be a pervasive effort in teacher education.

Evolving from this trend, the present study has specifically attempted to answer the following questions:

1. Do students in a research oriented student teaching experience show significantly greater gains in decision-making abilities as they are reflected in general teacher education outcomes?
2. What is the relationship of the outcomes of a teacher education program to basic student status data, both personal and social?

These general purposes are further elaborated in the form of nine specific questions in Chapter Three.

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CHAPTER II

PROCEDURE AND DATA COLLECTION

General Method

During the fall of 1960, all elementary education student teachers were assessed in order to identify an above average sample. The original intention, later discarded, was to focus upon an honor's program. The assessment was comprised of three basic measures: (1) grade point average in their first three years of college work; (2) scores on the College Qualification Test (CQT, Psychological Corporation, New York 36, New York); and, (3) predictive rating of potential success in teaching made by the university instructor responsible for the integrated program[1] to

[1]The Integrated Group: The integrated group within which the experimental, experimental control, and control groups operated is the basic organizational structure for facilitating the exchange of ideas and knowledge during the student teaching period of the elementary education program. At the sophomore and junior levels students become involved in courses introducing them to American Public Education and Child Development. During the senior year, students enter the student teaching program consisting of a full year of half time (morning) teaching. They are divided into Nursery-Kindergarten, Primary, and Upper Elementary Groups of from twelve to eighteen students. Each group is conducted by a faculty member who serves both as a supervisor of their student teaching and instructor of their student seminar which meets four times weekly for two-hour sessions.

The content of this seminar included concepts in elementary education curriculum, techniques of teaching, educational foundations and mental health. The entire program has been entitled "Integrated Group" to indicate the intention of the instructors to facilitate the integration between practice, in student teaching, and theory as well as to provide an opportunity for student examination of their professional ideas, problems and successes.

The students received five credits for student teaching and eight credits for integrated group in each of two semesters.

which they were assigned. Standard scores were computed for each assessment and a combined standard score was derived for each student. The highest 33 scores of the total population of approximately 73 were stratified by sub group, 15 in upper elementary (grades 4-8), 9 in primary (grades 1-3), and 9 in pre-school (nursery and kindergarten). Three groups were then identified by a process of random selection.

The three groups consisted of an experimental group, an experimental-control group, and a control group. Each group was composed of three students preparing for pre-school teaching, three training for primary teaching (grades 1-3), and five students training for upper elementary teaching (grades 4-8). The whole process of selection andplacement in groups was necessarily stratified in terms of these three areas of teacher preparation.

Groups

The Experimental Group: The 11 students placed in the experimental group were assigned at their appropriate level to a teacher in the Campus Elementary School. These students experienced one-half day of specialized student teaching each day, and one-half day four times a week in a variety of learning situations with one group leader. This arrangement continued for one full semester which was the second semester of student teaching for these students.

During the semester in this specialized assignment, each student was expected to act as a research assistant to his cooperating teacher, and to identify, design, and carry out his own research project in the classroom. These experiences were integrated by the group leader with the other learning activities associated with the integrated group program in which students were enrolled concurrently.

Conventional student teac hing experience also took place during this time.

The integrated group sessions were oriented toward research. During the second week discussion of research techniques, reports on classroom research and reading of research served to clarify the concepts and procedures to be used. During the following weeks one day was set aside for group discussion of individual student research plans and problems.

The Experimental-Control Group: The 11 students placed in the experimental-control group were assigned at their appropriate level to a selected teacher in the public schools. The public school teachers were selected from among the upper one-third by a process of having university supervisors rate on each teacher with whom they had worked. Students were placed with these teachers by random assignment, with a few exceptions on the basis of geographic and travel considerations. Public school teachers rated in the upper third were selected in order to counter the proposition that the laboratory school teachers who worked with the experimental groups might be of higher quality.

The experimental-control group contained all the program variables of the experimental group with the exception of the research activity and orientation. These students spent their integrated group program sessions in discussion of problems, individualized study, and the development of basic ideas about educational foundations, curriculum, and teaching methods.

The Control Group: The control group of 11 students represented the on-going program pattern. These students were involved primarily in the testing and interviewing phases of the project. There were no program alterations: student teachers were assigned to cooperating teachers selected through the regular administrative procedures; students were placed in integrated groups for their specific preparation levels (Upper Elementary, Primary, and Pre-school); students were placed with a number of different group leaders in the regular program; and, each student received two nine-week student teaching assignments (rather than the one full semester assignment of the experimental groups). This procedure represents the usual pattern in the Elementary Education program at the University of Wisconsin-Milwaukee.

Replication of Groups: The total pattern of these groups described above was replicated the following year with a new group of students. The basic change was a rotation of assignment of the two group leaders involved in the experimental and experimental-control group situations. Thus, over a period of two years there were two experimental groups, two experimental-control groups, and two control groups; 66 subjects in all.

Follow-up in the First Year of Teaching: Each of the 66 subjects were to be visited and interviewed at the end of their first year of teaching for a further analysis of status, difference, and change. Special effort was made to encourage these students to stay in the Milwaukee area, and the nature of this population allowed for relatively free access to first-year positions. The predicted placement data on graduates, plus the special efforts of the project personnel and the superior character of the population

contributed to the estimate that about 75 per cent of the subjects would be available for the follow-up study.

The percentage of students available for the first year follow-up for both years was 61%, of a total of 40 students including 13 from the experimental groups, 14 from the experimental-control groups, and 13 from the control groups.

The procedure described to this point is summarized in Table 1.

Table 1

General Procedures with Approximate N's

Spring 1961 N = 33	Spring 1962 N = 33	Academic Yr. 1962-63	Total Follow-Up N = 40
Three groups of eleven -- -- 33 subjects	Replication Three groups of Eleven--33 Follow-up on 22 Spring 1961 subjects	Follow-up on 18 Spring 1962 subjects	13 Experimental 14 Exp-Control 13 Control

Data Gathering

Data were gathered in three basic areas: selection variables described in the General Method section; criterion variables which were viewed as being affected by the instructional programs; and, status variables, conceptualized as constants or characteristics of the students involved.

The Criterion Variables: The criterion variables fell into three basic categories: (1) Variables reflecting cognitive understanding and knowledge relevant to instruction; (2) variables

reflecting student attitudes and values relative to instruction; and, (3) performances of students in the instructional setting (student teaching and first year teaching).

The criterion variables were measured by the following instruments and/or techniques.

A. Cognitive
   1. Teacher Education Examination Program (TEEP); General and Special field. (8 scores)
   2. Watson-Glazer Critical Thinking Test (1 score)
   3. Research Knowledge Test (1 score)

B. Affective
   1. Kerlinger Educational Values Scale (1 score)
   2. Minnesota Teacher Attitude Inventory (1 score)
   3. Research Attitudes Test (1 score)

C. Performance
   1. Teacher Characteristics Study Observation Scale--summary rating by Cooperating Teacher
   2. Teacher Characteristics Study Observation Scale--summary rating by University Supervisor
   3. Teacher Characteristics Study Observation Scale--Observer rating for one visit.

The criterion variables were accepted as representative of the outcomes that are sought by teacher education programs. Further data on problem definition, solution, and realistic projection to first year teaching were collected by a series of loosely structured, open-ended interviews. These data were considered as significant reflections of outcomes but were analyzed separately as reported in Chapter Three.

<u>The Status Variables:</u> Data were also collected concerning the characteristics and ability of subjects. These data were expected to provide insight into the relation of essentially non-program phenomena to the criterion variables. In a broad sense these data provide a basis for examining the feasibility of possible alternative hypotheses.

The status variables were measured by the following instruments:*

A. Manifold Interest Inventory
B. Ego Strength Test
C. Proverbs Test
D. Terman Concept Mastery Test
E. Allport-Vernon-Lindsey Study of Values.

Miscellaneous Data: Post meeting reaction sheets were collected after each session for each member of the experimental and experimental-control groups in an attempt to assess the general attitude and feeling tone of the two groups.

An adaptation of The Macdonald-Doll New York University Conditions for Learning Rating Scale was added to the Ryans' Teacher Characteristics Study Classroom Observation Record in the follow-up ratings during the first year of teaching.

Schedule for Collecting Data: Table 2 (p. 16) illustrates the schedule for collecting data. Because of the large number of tests administered, it was necessary to spread the testing over the full semester's time. Five of the criterion tests were administered as pre and post tests. The remainder of the criterion tests and measures were administered as post measures. Status variable measures were administered during the middle of the semester, with the exception of the three selection measures which preceeded the pre testing. Ratings and interviews were conducted periodically during the study and in the follow-up phase of the study.

---

*Selection tests and measures, i.e., C.Q.T., Grade Point Average, and Supervisors predictions of success were treated as Status data for part of the study.

Table 2

Schedule for Collecting Data

Selection Fall (1961-62)	Pre-tests (February)	Mid-tests (April)
College Qualification Test	Kerlinger Ed. Values	Allport-Vernon
Grade Point Average	Minn. Teacher Att. Inv.	Concept Mastery
University Supervisor Prediction of Success	Research Attitudes	Manifold Int. Inv.
	Research Knowledge	Proverbs Test
	Watson-Glaser	P.M.R. (continous)
	Interviews	Ego Strength
		Interviews

Post-tests (May)	Follow-up (Following Year)
T.E.E.P.	Classroom Observation Record
Kerlinger Ed. Values	Teacher Characteristics Study
Minn. Teacher Att. Inv.	Macdonald-Doll New York University Ratings (Adapted)
Research Attitudes	
Research Knowledge	
Watson-Glaser	
Student Teacher Ratings	
Interviews	

CHAPTER III

ANALYSIS AND RESULTS

This chapter discusses the procedures employed in the data analysis and the results obtained through these techniques. Five procedures were employed, namely:

1. Missing Data Correlation
2. Discriminant Analysis
3. Analysis of Covariance
4. Chi Square
5. Content Analysis of Interviews.

These data were analyzed at the Numerical Analysis Laboratory of the University of Wisconsin. Descriptions of the first three programs used are found in the Users Manual of the Numerical Analysis Laboratory, University of Wisconsin, under the code headings of STAT 1, DISCR, and ANCOV respectively.

These procedures provide the following treatment to the collected data:

Missing Data Correlation: The STAT 1 program allowed for the computation of a correlation matrix for all subjects on all variables by adjusting for missing data. Partial data were missing on three students (of the total 66) on measures gathered during student teaching, and on 26 students (out of 66) for follow-up performance ratings.

Discriminant Analysis: The DISCR program provided an analysis by groups and other conditions in relation to the total pattern of differences on all sixteen of the criterion variables at a given time. The data were treated in this manner rather than by a series

of significance tests for each variable due to the inability in large program studies to control all significant aspects. In this situation an overall pattern significance is a more meaningful analysis.

Analysis of Covariance: The ANCOV program provided an additional check on the central hypothesis by testing the significance of differences between groups on five criterion variables after allowance had been made for initial pre test scores.

Chi Square: The Chi Square Test*was used to examine the results of the categorized interview data.

Content Analysis of Interviews: The Content Analysis was developed as reported in Appendix B.

Results

The results were organized in answer to nine questions. These questions are:

1. Are there significant differences between program groups on the criterion measures?
2. Are there significant differences between sexes?
3. Are there significant differences between instructors?
4. Are there significant differences between year one and two?
5. Are there significant differences between upper and lower students?
6. Are there significant differences between personality types?
7. Are there significant relationships between criterion and other data?
8. Are there significant differences in kinds of student-teacher problems of different groups?
9. Are there significant differences in degree of realistic predictions of difficulties in teaching?

Each question will be taken up in turn.

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*Sidney Seigel, New Parametric Statistics, McGraw-Hill, 1956.

1. Are there significant differences between program groups on the criterion measures in relation to the experimental treatment? The first condition was that of the program. A discriminant analysis was run on the three groups (experimental, experimental-control, and control) in relation to the 16 criterion variables. An overall Lambda of .86653 and an F statistic of 1.95528 was obtained which was significant at the .05 level.

The F tests for differences in criterion variables for each comparison of pairs of possible groups are shown in Table 3.

Table 3

F Test on Criterion Variables for Each Pair of Groups

	1	2	3
1. Experimental	-	-	-
2. Experimental-Control	1.563730*	-	-
3. Control	3.493834*	1.358311	-

*Significant at or beyond .05 level

The experimental group scores were significantly different from either the experimental-control group or control group scores, whereas the experimental-control group scores did not vary significantly from the control group scores.

Since the direction of differences is not reflected in the discriminant analysis, an inspection was made of the means of the sixteen criterion variables. This is reported in Table 4.

Table 4

Comparison of Group Means on the 16 Criterion Variables

	High	Middle	Low	
1. Experimental	9	5	2	= 16
2. Experimental-Control	4	11	1	= 16
3. Control	3	0	13	= 16
	16	16	16	

It can be seen from this inspection that the higher means were generally reflected in the experimental group (9 cases) and the lower means (13 cases) in the control group. The experimental-control group means were predominantly in the middle, (11 cases). The results thus may be interpreted to mean that the experimental group's significant differences were in the direction of the hypothesis of positive differences.

Five of the 16 criterion variables tested by discriminant analysis had pre and post score measures. Scores on these 5 variables were subjected to an analysis of covariance to provide further insight into the question of whether there were significant differences between groups in terms of the experimental treatment. The results of this analysis are reported in Table 5.

Table 5

F Ratios and Significance Levels of Scores on the Five Tested by the Analysis of Covariance

Variable	F Ratio	Significance Level
Kerlinger Ed. Values Scale (Progressive vs. Traditional)	7.149398	.01
Minnesota Teacher Attitude Inventory	.066475	--
Research Attitudes	9.545044	.01
Research Knowledge	1.002212	--
Watson-Glaser Critical Thinking Test	.102612	--

It is apparent from Table 5 that two of the five variables have highly significant differences, namely Kerlinger Educational Values and Research Attitudes. Inspection of the post test means on all five variables revealed that the direction of differences on each, from high to low scores was: (1) Experimental, (2) Experimental-Control, and (3) Control. The fact that significant differences favoring the research hypotheses were found on two of the five variables tested by analysis of covariance was considered to be further evidence substantiating the rejection of the hypothesis of no difference among groups.

2. Are there significant differences between sexes on the Criterion measures? Of the 66 students involved in the study, 11 were male. A discriminant analysis was run to examine the patterns of variance existing between the 11 males and the remaining 55 females.

An overall Lambda of .6044 and an F statistic of 2.00419 were obtained. The latter was significant at the .05 level. Inspection

of the means revealed higher scores for the females on 12 of the 16 variables. However, the largest single difference was on the science and mathematics section of the T.E.E.P. which favored males. The results generally indicate a significant difference favoring female students.

3. Are there significant differences between instructors reflected in the student scores on the criterion measures? The two instructors who in rotation were responsible for instruction in the experimental and experimental-control group, a total of 22 students each over the two-year period, were analyzed via the scores on criterion variables for their students. To assess this effect a discriminant analysis was run on the 44 students who comprised the groups.

An overall Lambda of .61737 and an F statistic of 1.04 were obtained. The latter was not statistically significant at the specified .05 level. Inspection of the means indicated that 8 of the 16 means were higher for one instructor and 8 were higher for the other instructor. These results further indicate that there were no significant differences for instructors.

4. Are there significant differences between student's scores in terms of year one or year two in the study? Since the study was replicated a second year, the second group was considered to be a different condition and a discriminant analysis was run to examine any difference between years.

An overall Lambda of .58866 and an F statistic of 2.13998 were obtained. The latter score was significant at the .05 level. Examination of the means of the two-year groups indicated a higher mean for the first year group on 11 of the 16 variables.

From this we may say that the first year's students regardless of instructor, experimental variables, etc., performed significantly better on the criterion variables than the second year students.

5. Are there significant differences between upper elementary and lower elementary students in terms of scores on the Criterion measures? For the purpose of this study, two levels of education were identified: Upper and Lower Elementary. These levels indicate a variance in experiences in terms of the level of student teaching and the specific demands of each level. A discriminant analysis was run by level.

An overall Lambda of .51856 and an F statistic of 2.84324 were obtained. The latter was significant at the .05 level. Inspection of the means on the sixteen variables revealed higher means on 10 variables for the lower elementary group. The results indicate significant differences more positively oriented in the case of the lower elementary education students.

6. Are there significant differences between students with different personality types in relation to their scores on the Criterion measures? A discriminant analysis was run assessing the significance of the patterns of variation in mean scores of the seven personality types identified by the Manifold Interest Inventory in relation to the 16 criterion variables.

An overall Lambda of .12323 and an F statistic of 1.087 were obtained. The latter is not significant at the .05 level. Inspection of the means for each personality type and each of the 16 variables, revealed no suggestion of a common pattern. Thus,

no evidence of a systematic relationship was found between personality types and the criterion measures.

7. Are there significant relationships between scores on the Criterion Measures and scores on the data which describe or reflect student abilities, achievement, and characteristics known during student teaching and in the first year of regular teaching? To assess the relationship of measures of characteristics to measures of the criterion variables, an examination of the intercorrelation of 50 measures was made in order to gain insight into the relationship of non-program factors to the criterion variables. The 50 measures of status variables dealt with achievement, conceptual ability, general values, attitudes, and personality factors. The criterion variables treated as reflections of decision-making ability in this study dealt with knowledge, attitudes and values, and performance. The correlations were examined with seven categories in mind. These follow in order.

a. Student characteristics and knowledge scores on the Teacher Education Examination Program (T.E.E.P.). The eight scores comprised herein are one-half of the criterion measures. Inspection of the table of correlation and significance levels reveals the following results reported in Table 6.

Table 6

Variables Significantly Related to the Knowledge Scores

Teacher Education Examination Prog.	.05 level		.01 level	
A. Field Exam (Elem.Ed.)	(Pre-test) Minn.Tchr. Att. Inv.	.26	College Qual. Test (Verbal)	.46
	(Pre-test)Watson-Glaser	.29	Grade Point Average	.49
	Manifold Int.Inv.--Same Sex	.26		
	Allport-Vernon-Lindsey--Aesthetic Values	-.26		
	Manifold Int.Inv.--Music	-.26		
	Manifold Int.Inv.--Authority	-.26		
B. Foundations of Ed.	College Qual.Test (Total)	.27	College Qual. Test (Verbal)	.35
	Grade Pt.Ave.	.30	(Pre-Test) Watson-Glaser	.39
	Research Knowledge	.33		
	Ego Strength	.27		
	Manifold Int.Inv.--English	-.30		
	Manifold Int.Inv.--Business	-.27		
C. Child Development	College Qual.Test (Verbal)	.30	Grade Pt. Ave. (Pre-test)	.41
	College Qual. Test (Total)	.25	Watson-Glaser	.35
	(Pre-test) Kerlinger Educational Values	.26	Manifold Int. Inv.--Math	.37
D. Guidance and Measurement	College Qual.Test (Non-verbal)	.25	(Pre-test) Watson-Glaser	.42
	College Qual.Test (Total)	.28		
	Grade Point Average	.29		

Table 6 (cont.)

E. Methods	College Qual.Test (Verbal)	.30	Grade Pt.Ave.	.33
	College Qual.Test (Total)	.28	Manifold Int. Inv.--Humor	.35
	(Pre-Test) Watson-Glaser	.31		
	Allport-Vernon-Lindsey (Political)	.25		
	Proverbs	-.26		
F. English	(Pre-test)Watson-Glaser	.27	College Qual. Test (Verbal)	.41
			Manifold Int. Inv.--Business	-.41
G. History,	Grade Pt.Ave.	.25	College Qual. Test (Verbal)	.46
	(Pre-test)Kerlinger Ed. Values	.29	College Qual. Test (Total)	.50
	Manifold Int.Inv.--Methodical	-.26		
	Manifold Int.Inv.--Manipulative	.27		
H. Science and Mathematics	Group Leader Rating (Predictive)	-.24	College Qual. Test (Verbal) (Pre-test)	.35
	Allport-Vernon-Lindsey(Theoretical)	.28	Watson-Glaser	.40
	Manifold Int.Inv.--Acceptance of Impulse	-.27	Manifold Int. Inv.--Self Severity	-.33
	Manifold Int.Inv.--Leadership	-.25		

It is readily apparent from Table 6 that:

(1) Significant correlations are generally low, ranging from .28 to .50.
(2) A common pattern of positive relationships exists among the 8 sub-tests of the T.E.E.P., the College Qualitication Test (Verbal and Total), the Watson-Glaser Critical Thinking Test, and grade point average.
(3) Each individual sub-test has particular variables of significance not common to other sub=tests.

b. Student characteristics and performance scores. The three separate ratings during student teaching, made by the cooperating

teacher, the university supervisor, and a trained observer on the Ryans Teacher Characteristics Scale showed the intercorrelation listed in Table 7.

Table 7

Correlations of Performance Made by Three Separate Raters During Student Teaching

	Obs.	Coop. Tchr.	Univ.Supv.
Observer	--	.75*	.71*
Coop. Tchr.		--	.77*
Univ. Supv.			--

*Significant at or beyond the .05 level

These correlations were accepted as evidence of sufficient reliability on performance rating in student teaching in order to accept the data as meaningful. Significant relationships between performance data and student characteristics are found in Table 8. (See page 28.)

Inspection of Table 8 reveals the following:

(1) Correlations are generally low, ranging from .26 to .44.
(2) With two or more raters, a common pattern of positive relationships exist among the performance ratings and other variables on the Concept Mastery Test, group leader predictions, interest in identifying with others, interests in same sex, and the Minnesota Teacher Attitude Inventory.
(3) A common pattern of negative relationships exist among the performance ratings and other variables on the Proverbs Test, the Allport-Vernon-Lindsey Test and interest in music.
(4) Each rater produced a unique pattern of related variables.

Table 8

Significant Relationships between Performance in Student Teaching and Student Characteristics

Performance Raters		.05	.01
A	Concept Mastery Test	.29	Group Leader Prediction .37
	Manifold Int.Inv.-- Same Sex	.27	(Pre-test) Minn. Teachers Att.Inv. .41
	Manifold Int. Inv.-- Identification with Others	.26	Allport-Vernon-Lindsey (Theoretical) -.41
	Manifold Int.Inv.-- Dramatics	.26	Manifold Int. Inv.--Self Severity.34
	Manifold Int.Inv.-- Cleanliness	.29	Proverbs Test -.44
	Manifold Int.Inv.-- Self Severity	-.30	
	Manifold Int.Inv.-- Music	-.29	
B	Grade Point Ave.	.27	Manifold Int. Inv.-- Same Sex .32
	Manifold Int.Inv.-- Identification with Others	.26	Manifold Int.Inv.-- Music -.39
	Manifold Int.Inv.-- Methodical	.26	Proverbs Test -.43
	Manifold Int.Inv.-- Reading	-.26	
	Group Leader Prediction (Pre-test) Minn.	.30	
	Teachers Att. Inventory	.29	
	Allport-Vernon-Lindsey (Theoretical)	-.30	
	Concept Mastery Test	.27	
C	Manifold Int.Inv.-- Mathematics	.32	Proverbs Test -.37
	Manifold Int. Inv.-- Music	-.27	
	Manifold Int.Inv.-- Identification with Others	.27	

c. Follow-up ratings during the first year. The question of whether the findings of this study are relevant to first-year performance was examined by relating the first-year performance ratings made by observers on 40 of the 66 subjects to the variables assessed by an observer, university supervisor, and a critic teacher during the student teaching experience.

The summated ratings on the two rating scales used (Ryan's Teacher Characteristics Scale and the Macdonald-Doll Conditions for Learning Scale) correlated .92 when used by the three trained observers who visited each classroom three times. The correlation between first-year ratings and student teacher ratings are reported in Table 9.

Table 9

Performance Correlations Between Raters--Student Teaching and First Year

	S.T.,Obs.	S.T.,C.T.	S.T.,U.S.	Ryan's	Mac-Doll
Stu.Tchr.Obs.	-	.75*	.71*	.18	.22
Stu.Tchr.C.T.		-	.77*	.12	.17
Stu.Tchr.U.S.			-	.19	.26
Ryan's				-	.92*
Mac-Doll					-

*Significant at .05 or beyond

It is apparent that correlations between ratings made during student teaching and ratings made at the end of the first year of teaching are low. None of these correlations is significant at the .05 level. Thus, we have a phenomenon of highly correlated

intra-ratings at each period (student teaching and first year) that are not highly interrelated between the two periods of assessment.

The follow-up ratings, however, are consistent with ratings made during student teaching in that the pattern of significant correlations with other variables reveals significant relationships to:

(1) The selection criterion of group leader prediction,
(2) the Minnesota Teacher Attitude Inventory,
(3) interest in identification with others as measured by a subsection of Manifold Interest Inventory.

d. Relationship of student characteristics to the Kerlinger Educational Values Test.

The Kerlinger Educational Values Test assessing modern versus traditional values was significantly related to the following variables:

(1) Research Attitudes	.27
(2) Watson-Glaser	.29
(3) Manifold Int.Inv.--Humor	.26
(4) Manifold Int.Inv.--Cleanliness	.26
(5) Manifold Int. Inv.--Authority	-.47
(6) Minnesota Teacher Att. Inventory	.34
(7) Allport-Vernon-Lindsey (Aesthetic)	-.47.

e. Relationship of student characteristics to teacher attitudes.

The Minnesota Teacher Attitude Inventory measuring teacher attitudes, was significantly related to the following variables:

(1) Allport-Vernon,Lindsey Theoretical	-.37
(2) Allport-Vernon-Lindsey Political	.27
(3) Manifold Int.Inv.-- Leadership	.31
(4) Manifold Int. Inv. Cleanliness	.33
(5) Manifold Int. Inv.-- Same Sex	.27
(6) Manifold Int.Inv.--Self Humor	.26
(7) Manifold Int.Inv.-- Self Severity	.31
(8) Manifold Int.Inv.-- Biology	.28

(9) Manifold Int.Inv.-- Aggression	.33
(10) College Qual.Test (Total)	-.33
(11) Group Leader Predictions	.51
(12) Concept Mastery	.42
(13) Proverbs	.29

f. Relationship of student characteristics to critical thinking.

Other variables that were significantly related to the Watson-Glaser Test of Critical Thinking were:

(1) College Qual.Test (Verbal)	.36
(2) College Qual.Test (Non-Verbal)	.38
(3) College Qual.Test (Total)	.26
(4) Grade Point Average	.38
(5) Research Attitudes	.32
(6) Kerlinger Educational Values Test	.30
(7) Minnesota Teacher Attitude Inventory	.27
(8) Manifold Int.Inv.-- Social Science	-.31
(9) Manifold Int.Inv.-- Sports	-.26

g. Relationship of student characteristics to research attitudes and knowledge. Measures of attitudes toward research and knowledge of research methodology were significantly related to:

Research Knowledge:

(1) Manifold Int.Inv.-- Magic	-.34
(2) Manifold Int.Inv.-- Same Sex	.28
(3) Manifold Int.Inv.-- Family	.33

Research Attitudes:

(1) Minnesota Teacher Attitudes Inventory	.37
(2) Allport-Vernon-Lindsey (Religious)	.26
(3) Manifold Int.Inv.-- Humor	.27
(4) Manifold Int.Inv.-- Family	.34
(5) Manifold Int.Inv.-- Allport-Vernon (Aesthetic Values)	-.33

To summarize up to this point, the attempt to determine whether other variables of personality, ability, or background were related to the outcomes of the experiment as measured by the criterion variables, may be summarized as follows:

a. Different kinds of variables were related to the eight knowledge outcomes than were related to the eight abilities, values, performance, etc., outcomes.
   (1) Cognitive variables were related to previous achievement and critical thinking ability.
   (2) By and large, performance, attitudes, and values were more heavily related to personality variables.
b. Student teaching performance ratings and performance ratings in the first year of teaching were not highly related.
c. The University Supervisor's prediction after nine weeks of student teaching was most highly related to both later student teaching performance ratings and first year performance ratings.
d. No single variable or common pattern of variables were consistently related to all 16 of the criterion variables.

9. Are there significant differences in the kinds of problems identified and described between the experimental and control groups? This question grew out of the hunch that those students who received a research oriented student teaching experience would become more objectively oriented to problems in student teaching. The data were collected by interviews* and were examined to see whether or not a notable shift toward "objectivity" took place during the first two months of the experimental program (i.e., between the first and second interviews.).

A Chi Square Test was run to examine the proportion of responses in problem centered (objective) versus student teacher centered (personal or arising from the student teacher situation)

*See Appendix B for a description of the interview rationale and the interview procedure for asking questions and analyzing responses.

responses for the first and second interviews for all of the three groups. A two problem by three group table resulted for each interview. No significant differences between groups (.05) were found in either interview one or two. Inspection of proportions revealed a slight shift toward non-objective problems for all groups. Thus, the experimental group did not become more "objective" or its problem statement.

A serendipitous finding of some interest was the proportion of student-teacher identified problems which were related to being in a student teaching situation. The majority of problems verbalized during both interviews can be classified as problems created by the student teaching situation.

9. Are there significant differences between groups in the degree of "realistic" predictions made for the first year of teaching, or the range and degree of utilization of alternative solutions during the first year of teaching? Problems predicted in the third interview were analysed by groups and then compared with the actual problems identified in the follow-up interviews. The discrepancy between what was predicted and what actually became a problem, expressed in percentage of problems identified in third interviews that did not appear in the fourth interviews, was as follows:

Experimental	37%
Experimental-control	43%
Control	55%

These results would suggest a possibility of more realistic predictions on the part of the experimental and experimental-

control groups, with the direction of differences suggesting the possibility that the research-oriented group was most "realistic."

An analysis of the range of utilization of alternative solution processes during the first year of teaching was made. Seven categories of solution were developed from the data. These categories were:

a. Use of research method (collecting data).
b. Study method (Formal classes or informal learnings, e.g., readings).
c. Trial and error.
d. Insight
e. Attempts to apply previously learned solutions.
f. Clinics and observations in other classrooms.
g. Seeking help from school personnel.

Of these seven categories, two were markedly typical of the experimental group only. The use of research (five responses) and the use of observation in others' classrooms (five responses) were unique to the research group with the exception of one response for observation in the control group. This appeared to be a notable extension in the range of solutions employed by the experimental group in comparison with the other two groups.

The seven categories were combined into four for the purposes of analysis by the chi square test. A chi square of 7.80 with 6df was obtained. This does not meet the .05 criterion level for significance. Thus, there were considered to be no statistically significant differences between the three groups in the relative proportion of the kinds of alternative solutions utilized during the first year. Again, the only noticeable difference, not large enough to produce a statistically significant difference, was the almost total absence of use of the research process in any group but the experimental.

Subjective Reactions to the Interviews

"Who am I; how do I relate to other people; what are my problems in teaching; how do I really feel about teaching?" These are the unexplicated concerns that student teachers struggle with outside of the context of the formal preparation program.

As noted in Appendix B, one interviewer conducted the entire series of interviews in both phases of the study. A tremendous impact of the personal feelings and range of personality characteristics of the student teachers was experienced by the interviewer. These data were not readily amenable to quantitative analysis; they do, however, have import for our concern with identifying global qualities of persons which may be significant in developing fully functioning teachers.

A definite attempt was made to create a non-evaluative climate with loosely structures, open-ended questions which centered upon the student's problems and concerns in his student teaching experiences. (The students were told that it was not a function of these interviews to help them work out the problems they identified.) There was some evidence of hostility and resistance in the early interviews and some real concern expressed in response to the interviewing methods. Students often requested: "Please, ask me a definite question!"

As students became freer and more accepting of the non-evaluative situation they tended to see the interview as "gripe" sessions and used the situation to unburden themselves of a wide range of non-objective problems which experientially--emotionally and realistically--did exist in relation to the student teaching experience, but which students may not have had the opportunity

nor the freedom to discuss in the traditional student-teacher supervision session.

The resistance to early interviews was mellowed through successive experiences as evidenced in the 99% response to the follow-up interviews which were held on a voluntary basis for students doing their first year of classroom teaching in the Milwaukee area. Unintentionally, the freedom of the interview situation seemed to serve in varying degrees as release for some students and may have obscured the quantitative findings of the study. (Studies of non-structured versus structured biographies in counseling sessions have underlined the tendency for students to report more fully their deeper personal concerns and problems in non-structured writings.) On the other hand, the freedom of the interview situation served to illuminate and gradually define an awareness of differences in the readiness of individuals to profit by the research experience, or by any other kind of student teaching program. In the free discussion of problems, concerns, and interests related to student teaching experiences some individuals seemed strikingly more open to change than did others. This dimension of openness in personality cut across the three identified groups and the varying types of student teaching programs they were experiencing. (The hunch concerning relative openness of personality as a dimension of effectiveness in teaching is being investigated in another study.)

For the investigators in the present study the interviews sharply underlined the need to consider the global characteristics of the embryo teacher in designing a teacher education program which focuses upon developing persons as well as knowledgeable teachers.

CHAPTER IV

SUMMARY, CONCLUSIONS AND SUGGESTIONS FOR FUTURE RESEARCH

The logic of this study involved the following four step set of premises. (1) The development of systematic, rational thinking about teaching will improve the quality of teaching; (2) Research training will help develop rational systematic thinking about teaching; (3) General teacher education outcomes (cognitive, affective and performance) reflect the quality of thinking about teaching; and (4) The student teaching experience is the single most crucial element of a teacher education program.

Three groups of above average students were selected from the total population of elementary education student teachers in two successive years. These groups were: the experimental, which received a modified program and research experiences in student teaching; the experimental-control, which received a modified program only; and, the control, which experienced no modifications in program.

Measures of knowledge, attitudes, values, ability, personality, and performance relevant to teaching and to other more general areas were collected during the semester, as well as a series of three interviews concerning problems in student teaching. Follow-up performance ratings and interviews were conducted at the end of the first year of teaching. There were a total of 66 subjects, 22 in each group during student teaching and 40 in the follow-up study.

The Experimental Program

The major hypothesis of the study dealt with the observable effects of a research-oriented, student teaching experience on the improvement of decision-making in teaching.

The selection of the 16 criterion variables as reflections of decision-making ability abstracted the analysis to a more general level. Thus, it is not clear whether the actual decision a teacher makes is affected or not. Nevertheless, the criterion variables deal with a wide range of cognitive, affective and performance aspects of teaching which encompass the more general assessed outcomes of a teacher education program. These outcomes may be said to reflect the decision-making ability of the teacher.

The evidence gathered and tested by Discriminant Analysis for all 16 variables and an analysis of Covariance for the five pre-post variable tests indicate a general significantly higher performance for the experimental group. It may be concluded from these analyses that participation in the experimental program was conducive to positive and significant growth on the part of the experimental group.

The experimental-control group also showed positive scores higher than the control group, but not as high as the experimental group. It should be remembered that the experimental-control group was also treated in a special manner as a unique group with a modified program. The control group was left in the usual program and the members of this group had no single group identity. Thus, there is a suggestion of the operation of the "Hawthorne Effect" in the results of this study. The data show that both groups, experimental and experimental-control, scored higher than the

control; however, the experimental group was consistently the highest. The results tend to support the conclusion that there could be a compounding interaction between the experimental variables and the "Hawthorne Effect."

Evidence gathered from the interviews also tend to bear out this conclusion. Both experimental and experimental-control groups voiced awareness of the special nature of their participation. However, the follow-up data indicated that only the experimental group identified research processes for solving problems during the first year of teaching.

Staff evaluations of the experimental program have identified an important limitation in relation to the experimental program. The staff members involved felt that the research training given the experimental group did not have the depth nor consistency necessary to give the research idea its most rigorous test. Due to time limitations and the general format of the integrated "group" experience, there did not appear to be the systematic motivation and involvement that would have been ideal. Although results were generally positive, greater differences might be expected if the research training aspects of the program could be intensified and made more systematic.

Nevertheless, the researchers conclude that the research-oriented program examined in this study made a positive difference in the teacher education outcomes.

Concomitant Conditions during the Experimental Period

The research was carried on over a two year period involving two student teaching groups. The study was replicated to enlarge

the number of participants. There were several concomitant conditions during the experimental period which should be discussed: instructors were rotated between the experimental and experimental-control groups over the two year period; student personality types were assessed and, a sizeable number of men were included in the study. The most surprising finding among the concomitant conditions was the failure to uncover any significant effect on the criterion variables of either the instructors or the student personality types.

The two instructors who rotated through half of the experimental and half of the experimental-control students (or group leaders in two separate years) were markedly different in personality and general operating procedures, as well as being from opposite sexes. They shared the general philosophy of the program and a willingness to participate in the project. Though any conclusions drawn from these findings must be interpreted with caution, it is at least worth noting that the instructor apparently was not a significant factor in any manner in this study.

The student personality types were identified by the Brooklyn College, Heil-Washburne study group using the Manifold Interest Schedule. This schedule was selected because of significant findings from the Brooklyn study in relation to personality types. It was of great interest to note that when students were classified by personality types there were no significant differences on the criterion variables between the various types. One may, of course, suggest that the criterion variables identified in the study do not represent crucial or first-order phenomena. In a sense this is correct, yet we might expect some relationship between these

common cognitive, affective and performance variables and personality types if the personality type is a useful construct in the context of teacher education programs.*

Other concomitant conditions (sex, level, preparation and year of the study) yielded significant differences in the discriminant analysis. It was not surprising that women outperformed the men, or that lower elementary outperformed the upper elementary trainees. There is, of course, a compounded factor here, in that all but one of the male students was also in the upper elementary program.

Perhaps of more interest was the finding that the student group which participated in the first year of the study outperformed the group in the second year. A number of possible explanations can be suggested. Possibly the first group was a better group initially. Or, the "Hawthorne effect" may have been operating as the project was initiated. Possibly the hostility, clearly evident in the small groups, affected the second groups morale and its participation in the project.

Both instructors' evaluations during the study indicated that the general quality of their students during the second year was not as high as that of the first group. This is, of course, a subjective opinion but it might reflect some difference between the groups due to factors that are not known and/or were not controllable.

The Relationship of Criterion Variables to Status Variables

The collection of a large number of status or descriptive measures of students in the study proved enlightening, if somewhat

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*Personality variables did have meaningful relationships in the study, but personality "types" did not.

unwieldy. Large correlation tables do not produce definitive results, but the results were highly suggestive of interesting possibilities in this study. It would, of course, have been simpler if a few well chosen variables could have been used instead of a "shotgun" approach. Unfortunately, the identification of these few crucial variables has not been achieved in teacher education research up to this time, and the results of this study will be of only minimal value for facilitating that problem.

One especially interesting finding coming from the correlational data is that cognitive (knowledge and critical thinking) variables were related to an essentially different set of status variables than were the performance and/or affective variables. It makes some sense that "like begets like;" however, the finding that knowledge about teacher education is essentially related to past academic performance, and performance ratings are essentially related to affective and personality measures raises questions about present trends towards higher academic standards in teacher education.

If one accepts the data of this study at face value, we can conclude that one implication of the study is that selecting higher achieving students leads to greater knowledgeability about content in teacher education. However, it seems quite apparent that this selection will in no way insure any carry over of this knowledge into those desirable variables assessed by rating scales or affective measures. This finding would seem to underscore a statement by Travers and Wallen,* that:

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*"Analysis and Investigation of Teaching Methods," Chapter 10, Handbook of Research on Teaching (Chicago: Rand McNally & Co., 1963), 460.

> Although it is well known that the development of affective responses and cognitive components related to them may occur without influencing behavior to any great extent, most teacher training programs do little to develop in the teacher-trainee any action system through which results of teacher training may be manifested in the classroom . . . .

And as Getzels and Jackson* remark:

> Despite its attractiveness as a hypothesis, the proposition that very high cognitive ability is sine qua non of the good teacher has relatively little empirical support.

Another interesting finding was the essentially unrelated nature of observation during student teaching and at the end of the first year of teaching. The correlation on the rating scales between observers in the follow-up study and between rating scales during each separate period are the highest correlations obtained in the study, thus providing evidence of high reliability, yet essentially no relationship between periods.

This finding surely suggests that the pressure of actual first-year teaching may produce considerably greater alteration of teacher behavior than that which took place during student teaching. Of course, one might hypothesize that student-teacher behavior is essentially conforming behavior which does not reflect the "true" action tendencies of the student, but either conclusion casts some doubt on the traditionally held value of the student teaching experience.

The data gathered by interviews add to this doubt. It was somewhat of a shock to note that over half of the problems students verbalized during student teaching were related purely to the conditions of student teaching. If one assumes that productive

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*Ibid., Chap. 11, "The Teachers Personality and Characteristics," p. 374.

learning of desirable teaching behavior is the goal of student teaching, then it would seem undesirable to create considerably more problems for students through the nature of the teacher education program rather than finding some way for focusing students primarily on classroom learning problems. Bach's* finding that there is no relationship between student teaching ability and success in the field seems congruent with the results reported here.

The only measure which remains significantly related to both sets of performance ratings was the selection measure, the prediction of success in teaching made by university instructors who had observed the students for nine weeks in the beginning phases of student teaching. The fact that these early predictions of success remained significantly correlated to performance at the end of student teaching, and also at the end of the first year of teaching, raises some interesting speculation.

By and large one might say that first impressions are fairly accurate. But perhaps even more to the point, this finding raises questions about change brought about by the student teaching experience. Why should there be such a high correlation after 27 more weeks of student teaching? What changes have been brought about?

Even more startling are the carry-over findings in the first year of teaching. If ratings after the first year are essentially unrelated to those during student teaching, then why should instructor predictions correlate significantly with both sets of data? Are we to assume that a single prediction of success by a

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*Bach, Journal of Education, XXI (1952), 57-80.

qualified instructor after an initial look at a student teacher is the best single index of future performance in teaching?

Part of the answer to these questions may lie in the nature of the program involved. It is important to remember that the "group" experience involves the instructor in a supervisory relationship during one-half of each day and a continuous instructional relationship with the same students on the other half day. Instructors are able to "see" and know students in a variety of situations revealing aspects of performance, cognitive ability and personality. This global experiencing of students by qualified persons may well provide the best predictive procedure.

The question remains as to why this prediction is possible if the major portion of the student teaching experience lies ahead as well as does the experience of first year teaching. Two possible explanations are suggested here: (1) That the criteria used for prediction were almost identical to the rating dimensions used for observations; or (2) That there is a global quality about individuals, tied to personality and ability, but evidenced in interpersonal relations as a "gestalt" which remains essentially consistent regardless of training method or traditional student teaching experience. The second seems more plausible to the writers. If this explanation were confirmed in future studies, it would suggest that teacher education programs would be better focused on the quality of "persons" rather than the quality of a wide variety of "performances" of individuals. Under any circumstance, a basic assumption of this study concerning the significance of the student teaching experience should be seriously questioned.

Suggestions for Further Research

A study of the scope represented here is bound to raise many questions rather than to produce definitive answers. This was certainly true in this present study.

Some questions were raised as a result of the limitations of the present study, others are suggested by the results of the hypotheses testing, and still other questions occurred because of unexpected, puzzling, or unexplainable findings. Following is a listing of the most significant questions generated by the present study:

1. What role does the subject's knowledge of participation in an experiment play in the subsequent results?
2. What effect do teacher-education programs have upon the actual on-going decisions that teachers make?
3. What effect would a more prolonged and systematic research experience have on the development of teacher ability as reflected in general outcomes?
4. Can a "global" quality of persons be identified in the context of teaching which will allow accurate predictions of future performance?
5. Would teacher education programs that focus upon developing persons rather than performers produce better results?
6. Would various program practices which would avoid the creation of special situation problems be more valuable for developing teachers than the traditional student teaching experience?

Any, or all, of these questions imply fruitful areas for further research in developing effective teacher education programs. These questions emphasize the complexity of the complex of variables which need to be examined in future studies of teacher education programs.

APPENDIX A

REFERENCES FOR INSTRUMENTS USED TO COLLECT DATA

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APPENDIX B

DESCRIPTION OF THE INTERVIEW RATIONALE AND THE PROCEDURES FOR ASKING QUESTIONS AND ANALYZING RESPONSES

Rationale

The rationale for the series of interviews with student teachers was predicated on the assumption that a teacher's identifications of his problems and concerns is a critical aspect of his problem-solving behavior in the classroom. Thus, the student teacher's unfolding awareness of problems and concerns as his teaching experience progresses, and the range of possible solutions he projects were considered pertinent evidence of his problem-solving behavior in the classroom.

These assumptions are consistent with the investigation of the research experience as a systematic model of behavior that could serve as a basis for improving the problem-solving behavior of teachers.

If experiencing a systematic procedure of identifying and solving classroom problems through action research does enhance a student teacher's problem-solving behavior, where may we look for evidence of such change? Three areas of anticipated change were identified as a basis for quantitative analysis of the interviews:

> Focus--A broader and more inclusive focus in identifying classroom problems and concerns;
> Range--Increased ability to project a range of alternative solutions;
> Application in fir t year--Application of systematic approach to problems in first-year teaching.

Procedure

A crucial aspect of the interviewing procedure was a non-threatening climate to promote free responses without fear of evaluation or retaliation. It was possible to set up a non-evaluative situation in which the interviewer was not connected with the elementary education teaching program nor with the evaluative aspects of the research study. One interviewer conducted the series of interviews for both phases of the study.

A series of four interviews was planned for each student teacher participating in the study; the first three interviews were scheduled at spaced intervals during the student teaching semester, the fourth interview was part of the follow-up program at the end of the first year of classroom teaching.

The first two interviews were non-structured; they focused on the student's identification of his problems and concerns in his student teaching experience.

The third interview, semi-structured, asked the student teacher to anticipate the kinds of problems he expected to meet in his first year of classroom teaching.

1. On the basis of your student teaching experience what concerns or problems do you anticipate in your first year of teaching?
2. What kinds of help will you need to resolve the problem?
3. What possible solutions do you see in the area of your concern?

The fourth interview, planned as part of the follow-up program at the end of the first year of classroom teaching, necessarily involved only those students who were doing their first year teaching in the Milwaukee area. The student was asked to respond to five questions:

1. What have been your major concerns in your first year of teaching?
2. What have you done about them; in what ways have you attempted to resolve the problems or concerns?
3. Have you tried any new ideas in your classroom that you had not anticipated using?
4. What kind of self-improvement activities have you participated in during this last year?
5. In what ways could our teacher education program have better prepared you for your teaching job?

(NOTE : Responses to 4 and 5 were not analyzed for the present study.)

Analysis of the Interviews

The content analysis of the first two interviews was concerned with identifying and categorizing the student's frame of reference (orientation) for each concern he specified. Two general categories of focus for each concern were seen as (1) problem orientation, and (2) object orientation. Each of the two major areas was subdivided as follows:

1. Problem orientation--analyzed in terms of identification of the problem as classroom oriented, student-teacher oriented, or no problems indicated.
   a. Classroom oriented primarily related to the context of the classroom situation
      (1) Purposes for learning
      (2) Continuity of learning
      (3) Children's behavior (immediate action context)
      (4) Teacher and School
      (5) Background and related factors
      (6) Method and materials
      (7) Values (as distinct from decision about purposes)
   b. Student-teacher oriented; primarily related to position as a student teacher
      (1) Children's learning--curriculum
      (2) Personal problems
            functioning--related to emotional problems
            functioning--related to capacity, emphasis on subject matter
      (3)Continuity of learning
      (4) Relation to university personnel and other students
      (5) Relation to cooperating teacher and school
      (6) Values (as distinct from decisions about purposes)
   c. No problems
      (1) N.P.--no identification of problems
      (2) N.P.1--problem identified later, in course of interview

2. Object orientation indicating primary emphasis in one of these areas:
   a. Self-ego orientation
   b. Content-Culture orientation
   c. Pupil--other orientation (including student-cooperating teacher relationship)
   d. Social-society orientation

Interviews three and four were analyzed as a unit; the content analysis was directed to these questions:

1. How realistic was the student teacher's anticipation of first year teaching problems (comparison of interviews 3 and 4)?
2. What was the range of solutions reported after the first year of classroom teaching (interview 4)?

NOTE: The third interviews of student teachers not available for the follow-up program were not included in the analysis for this study.

APPENDIX C

SELECTION CRITERIA: INSTRUCTOR'S PREDICTIVE RATING SHEET

Suggestions for rating student teachers:

Student rating is to be made on all-over basis.

Rating is to be made according to four categories: Superior--Good--Average--Poor. Plus and minus may be added to each or any of the categories.

Description of four categories to be used in rating:

1.	Superior	(+,-)	This person will be a superior teacher.
2.	Good	(+,-)	This person will be a good, dependable teacher.
3.	Average	(+,-)	With proper guidance, this person will be a satisfactory teacher.
4.	Poor	(+,-)	At the present time, I doubt that this person will develop into a satisfactory teacher.

APPENDIX D

POST MEETING REACTION SHEET

Place an X on the line below at that point which approximates how you feel after today's group meeting. There may be many reasons for your feelings. However, do not worry about this--just put down your general feeling.

The line is a continuum of feeling, and points along the line are to be thought of as guides, not exact places to put your X.

Bored	**In Between**	**Excited**
Disinterested		**Interested**
Dissatisfied		**Satisfied**
Displeased		**Pleased**

APPENDIX E

RESEARCH PROGRAM PROCEDURE FOR THE EXPERIMENTAL GROUP

I. Each student will serve as a research assistant for his Campus School Teacher. This means some kind of involvement with the teacher's project.
II. Each student will be expected to develop a project of his own to be completed during the semester.
III. The second week of group meetings will be devoted to research with the following goals in mind:
    A. Verbalize the following framework: A research study involves
        1. A hypothesis;
        2. A research design and procedure;
        3. Collecting data;
        4. Testing or evaluating the data.
    B. Verbalize kinds of research and distinctions:
        1. Experimental;
        2. Descriptive (status);
        3. Historical and/or Ex post facto;
        4. Exploratory.
    C. Have beginning idea of following concepts:
        1. A hypothesis must be stated in operational terms;
        2. The population and sample you use has implications for the generality of the results;
        3. Some kind of controls are necessary--e.g.
            a. matching subjects
            b. selecting randomly
            c. selecting purposively.
        4. There are a variety of designs--(See Barnes)
        5. Data collected should neet criteria (process used) of:
            a. objectivity
            b. reliability
            c. validity
            d. practicality
            e. useability
        6. Results must be evaluated in terms of the confidence you have in them, e.g.:
            a. inferential statistics
            b. logic
            c. generalizability.
IV. The procedure for the research group for the semester will be as follows:
    A. During week one, the Barnes material will be passed out and assigned.

B. Week II
   1. Monday--a report from a C.S. teacher on her project--draw out ideas listed above.
   2. Tuesday--dry run attitude scale with Sign Test.
   3. Wednesday--Discuss Barnes material and point out ideas and concepts above.
   4. Friday--Further discussion and beginning of orientation for individual projects, etc.

C. Every Friday thereafter--A research seminar built around individual projects. Reporting and questioning, suggesting, thinking together about projects--Schedule systematically.

APPENDIX F

CLASSROOM OBSERVATION RECORD

Student Teacher_____ Observer_____

PUPIL BEHAVIOR		REMARKS
1. Apathetic	1 2 3 4 5 6 7 N	Alert
2. Obstructive	1 2 3 4 5 6 7 N	Responsible
3. Uncertain	1 2 3 4 5 6 7 N	Confident
4. Dependent	1 2 3 4 5 6 7 N	Initiating
TEACHER BEHAVIOR		
5. Partial	1 2 3 4 5 6 7 N	Fair
6. Autocratic	1 2 3 4 5 6 7 N	Democratic
7. Aloof	1 2 3 4 5 6 7 N	Responsive
8. Restricted	1 2 3 4 5 6 7 N	Understanding
9. Harsh	1 2 3 4 5 6 7 N	Kindly
10. Dull	1 2 3 4 5 6 7 N	Stimulating
11. Sterotyped	1 2 3 4 5 6 7 N	Original
12. Apathetic	1 2 3 4 5 6 7 N	Alert
13. Unimpressive	1 2 3 4 5 6 7 N	Attractive
14. Evading	1 2 3 4 5 6 7 N	Responsible
15. Erratic	1 2 3 4 5 6 7 N	Steady
16. Excitable	1 2 3 4 5 6 7 N	Poised
17. Uncertain	1 2 3 4 5 6 7 N	Confident
18. Disorganized	1 2 3 4 5 6 7 N	Systematic
19. Inflexible	1 2 3 4 5 6 7 N	Adaptable
20. Pessimistic	1 2 3 4 5 6 7 N	Optimistic
21. Immature	1 2 3 4 5 6 7 N	Integrated
22. Narrow	1 2 3 4 5 6 7 N	Broad

APPENDIX G

MACDONALD-DOLL NEW YORK UNIVERSITY CONDITIONS OF LEARNING OBSERVATION SCALES

BASIS AND FUNCTION OF SOCIAL CONTROL

Is control shared? Does the teacher make most decisions? Are there rules and are the children aware of them? Can children predict the bases of control?

_____

_____ Behavior in room is orderly and control is shared

_____

_____

_____ Behavior is orderly, but control is teacher imposed

_____

_____

_____ Behavior is not orderly; a lack of accepted structure or leadership

_____

KNOWLEDGE OF CHILDREN AND THEIR DIFFERENCES

Does the teacher know his pupils as individuals? Does he know the group? Does he make allowances for individual and group differences?

Children generally are treated as a group, and the group is seen as the teacher's idea of a group--not in terms of the nature of the group

Teacher appears to be aware of some individual differences, and attempts to use this knowledge in the context of a group setting

Individual differences appear to be a major focus for planning and children work out of their group individually in many ways; groups are usually determined by content or activity

TEACHER VITALITY, AWARENESS, ALERTNESS

Does the teacher have a quality of vital awareness? Does he live his teaching or does he treat it as a social role? Is his performance perfunctory and disinterested in contrast to being imaginative and creative?

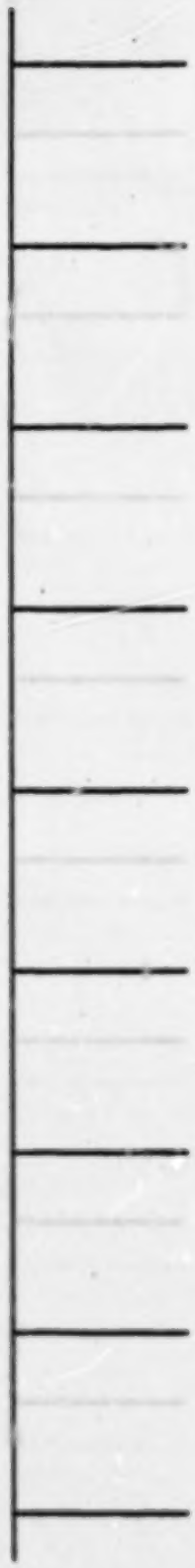
Teacher is apparently disinterested and bored with situation

Teacher is doing a "workmanlike" job and displays occasional spurts of interest and enthusiasm

Teacher is highly absorbed and keenly aware of the various aspects of the situation

NATURE OF MATERIALS IN USE--EMPHASIZE PUPIL INVOLVEMENT

Does the teacher have a variety of materials present? Are the materials of good quality? Are materials appropriate for the teacher's aims? Has the teacher gone beyond the standard materials and/or been creative in her preparation?



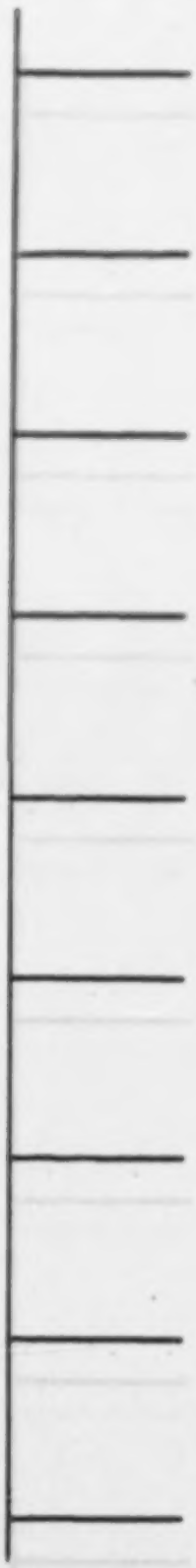
Wide variety of appropriate materials, with evidences of pupil involvement

A variety of materials with little sign of pupil involvement

Little sign of appropriate materials

CHILDREN'S RESPONSE TO THE TEACHER AS A PERSON

How do children react to the teacher?


Children interact freely with teacher
Children interact with teacher, with fluctuating freedom
There is little free interaction with the teacher

CHILDREN'S PARTICIPATION IN EVALUATION

Is evaluation an integral part of the program? Are the children actively involved in evaluation? Do the children take all their evaluation cues from the teacher?

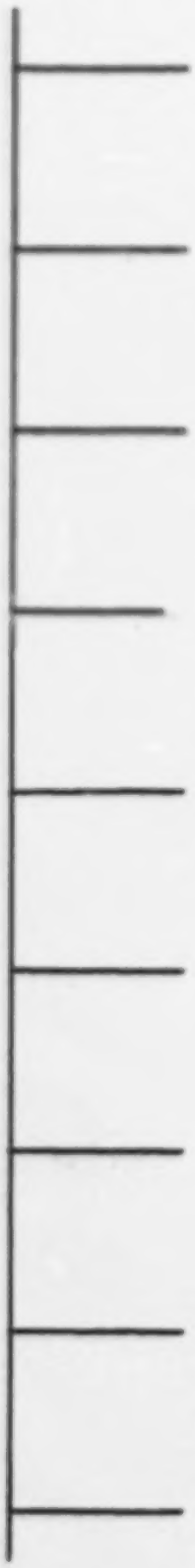
Evaluation is relatively continuous, either self, group or peer

Children participate in evaluation, but teacher sets procedures and directs judgmentally

Children have little involvement in evaluation

COMMUNALITY OR COMPLIMENTARITY OF TEACHER-PUPIL PURPOSES

Given a task, are the teacher's purposes for this task in conflict with the pupils' purposes for activity? Is there a positive correlation between pupil and teacher purposes?



Purposes are apparently divergent, almost all pupils appear to have reasons for activity which conflict with teacher's instructional objectives

About an even distribution of complimentary and divergent purposes among the children

Almost all pupil and teacher purposes compliment each other and produce harmonious task or activity orientation

INTERPERSONAL CONTACT (TASK ORIENTED)

Are all children given opportunities to be included in class talks? Does the teacher focus on a segment to the exclusion of others? Are learning acti ities flexible enough for productive interpersonal contact?

Activities are characterized by rigidly fixed location of pupil and teacher, little opportunity to interact except by rather rigid lines of communication

Relatively fixed locations of pupil but some degree of freedom of communication among teachers and/or pupils

Task oriented, but free flow of people and ideas

CHILDREN'S RESPONSE TO EACH OTHER

Do children apparently respect each other and each other's rights? Is there an easy acceptance of each other? Are there signs of affection toward each other? Are children sensitive to each other's feelings and attitudes? (appropriate for age level)

Children tend to be highly critical of each other, a definite competition for teacher approval pervades, little liking or respect for others is apparent in children's actions

A live-and-let-live attitude prevails, children seem willing to accept others if left alone, but general reserve exists

Children are sensitive to each other, give and take relationship which seems to flow from within, interest in each other as people beyond the immediate situation appears to exist

CHILDREN'S INVOLVEMENT IN LEARNING EXPERIENCES

Are the children interested in what they are doing? Are they investing emotional energy in the learning experience? Is there a sense of importance and eagerness about their own activity in the learning experience?

Children are apparently investing little energy in activity, seem almost unaware of what is going on (learning task)

Children are apparently committed to activity, have put themselves into it, but tend to lack any real absorption or concentration

Experiences are absorbing, interest carries children beyond the immediate and leads them to experiment and/or project beyond specific activity

APPENDIX H

ILLUSTRATIVE STUDENT TEACHER RESEARCH PROJECTS

1. Nursery School.

   Hypothesis: Boys are ill and absent more often than girls in nursery school.

   The current year's attendance records and three previous years' records were analyzed.

2. Nursery School.

   Hypothesis: If science concepts in the area of sound are presented to junior kindergarten children, then there will be an increase in their knowledge, application, and interest in these concepts.

   Organized sound experiences followed and preceded tests in children's use of selected science materials.

3. Four-year Kindergarten.

   Hypothesis: Those children who are accepted by the group share materials more than children who are not accepted.

   Three planned situations with limited materials were provided, and systematic observations were made. The children were ranked on the basis of these observations. They were also ranked in acceptance by their classmates, by the teacher, and by the student teacher.

4. Kindergarten.

   Hypothesis: If pre-primary children are given experiences with simple machines then they will be able to deal with concepts related to these machines.

   Organized simple machine experiences followed and preceded tests in children's use of selected science materials.

5. Five-year Kindergarten.

A study of the attention span exhibited by children in the kindergarten, based on systematic observations to answer the following questions:

a. What is the range of attention span in the group?
b. Which activities appear to produce longer attention spans?
c. Do some children usually show longer attention spans?

6. Kindergarten

Hypothesis: If a child is engaged in an individualized program in a kindergarten class, there will be no change in his social standing in the class.

Three groups formed on a voluntary basis of interested readers, orregular readers, and non-interested readers received sociometric tests before and after reading instruction.

7. First Grade.

Hypothesis: Those children who are more mature are more accepted by the group.

Characteristics of maturity which were measured are:

a. self-direction
b. leadership
c. problem-solving behavior
d. planning in a group situation

Rankings on these characteristics were correlated with ranking based on a social distance scale.

8. First Grade.

Hypothesis: If first grade children are allowed to determine the extent of their own work and play periods, then they will arrive at a pattern appropriate to their educational needs.

Individual children's time in work and play activities were recorded over a period of three weeks.

9. Second Grade.

Hypothesis: If children are provided with a reason for performing repetitive tasks then their performance will be better than if they are not provided a reason.

Experimental and control classroom groups were provided boring repetitive tasks with the experimental group given a logical reason for the task and the control group no reason. Observers, not informed as to the identity of each group, rated performance on observation check sheet.

10. Second Grade.

    Hypothesis: Those children who are more critical also tend to be more anxious.

    Ranking by the teacher and student teacher was used to measure degree of criticalness. A modified form ofSarason's anxiety scale was used to measure anxiety.

11. Third Grade.

    Hypothesis: If psychological re-enforcement is given to an experimental group of children, then they will produce more original ideas in response to certain stimuli than a control group not receiving the stimuli.

    The two groups of children wrote stories with the experimental group receiving extra stimulation of a sensory and verbal reinforcement nature.

12. Third Grade.

    Hypothesis: An experience outside the classroom (i.e. a two day camping experience) will lead to greater acceptance of rejectees by the rest of the group.

    A questionnaire concerning choices for various experiences was given twoce before and once after the trip.

13. Fourth Grade

    Hypothesis: If students are divided into under-achieving and over-achieving groups, and given a questionnaire reflecting their feeling of participation in the classroom, then the over-achieving student will have a greater sense of classroom participation.

    Hypothesis 2: If the students are divided into under-achieving and over-achieving groups and a questionnaire applied to reflect the individuals' need for independence, in work and thought, the over-achieving group will show the greatest need.

    Intelligence and achievement scores were used to separate children into over-achieving and under-achieving groups. Results of participation and independence questionnaires were compared with the over-achieving and under-achieving factors.

14. Sixth Grade.

    Hypothesis: If certain map reading skills are stressed in a short map study project, there will be a greater reduction in mistakes in these skills as compared to reduction in mistakes in all the skills combined upon retesting the same material.

Instruction in different phases of map reading skills followed and preceded tests in the skills.

15. Seventh and Eighth Grades.

Hypothesis: If students learn the structure of various literary forms, such as the novel and short story, then they will become more interested in reading and enjoying these forms.

Instruction in literary forms followed and preceded literary attitude tests.